

CLAIMS

1. A motion control apparatus for a vehicle comprising:

vehicle-body speed obtaining means for obtaining a vehicle-body speed of the vehicle;

steering-member operating amount obtaining means for obtaining an operating amount of a steering member of the vehicle which changes a steering angle of steerable wheels of the vehicle;

actual lateral acceleration related quantity obtaining means for obtaining, as an actual lateral acceleration related quantity, an actual value of a lateral acceleration related quantity indicating the extent of turning of the vehicle;

target lateral acceleration related quantity calculating means for calculating a target lateral acceleration related quantity which is deviated from a reference lateral acceleration related quantity so as to prevent the vehicle body from rolling excessively, the reference lateral acceleration related quantity being a reference value of the lateral acceleration related quantity which is determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount; and

braking force control means for controlling a braking force applied to each of front and rear wheels of the vehicle so that the actual lateral acceleration related quantity approaches the target lateral acceleration related quantity.

2. A motion control apparatus for a vehicle according to claim 1, wherein the target lateral acceleration related quantity calculating means calculates,

as the target lateral acceleration related quantity, a quantity which is deviated from the reference lateral acceleration related quantity in accordance with the vehicle-body speed.

3. A motion control apparatus for a vehicle according to claim 2, wherein
when the vehicle-body speed is at least a prescribed value, the target lateral acceleration related quantity calculating means calculates the target lateral acceleration related quantity in accordance with the vehicle-body speed so that the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of the reference lateral acceleration related quantity; and

when the vehicle-body speed is less than the prescribed value, the target lateral acceleration related quantity calculating means calculates the target lateral acceleration related quantity in accordance with the vehicle-body speed so that the absolute value of the target lateral acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity.

4. A motion control apparatus for a vehicle according to claim 3, wherein the target lateral acceleration related quantity calculating means changes the amount by which the target lateral acceleration related quantity deviates from the reference lateral acceleration related quantity in accordance with the steering-member operating amount.

5. A motion control apparatus for a vehicle according to any one of claims 2 to 4, wherein

the prescribed rule determines the reference lateral acceleration related quantity based on an actual specification value of the vehicle which influences the turning properties of the vehicle; and

the target lateral acceleration related quantity calculating means calculates, as the target lateral acceleration related quantity, the reference lateral acceleration related quantity determined in accordance with the prescribed rule and on the basis of a control specification value instead of the actual specification value, the control specification value being deviated from the actual specification value in accordance with the vehicle-body speed or the vehicle-body speed and the steering-member operating amount.

6. A motion control apparatus for a vehicle according to claim 1, wherein the target lateral acceleration related quantity calculating means is constructed to calculate the target lateral acceleration related quantity in such a manner that the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of the reference lateral acceleration related quantity.

7. A motion control apparatus for a vehicle according to claim 6, wherein the target lateral acceleration related quantity calculating means is constructed such that the amount by which the target lateral acceleration related quantity deviates from the reference lateral acceleration related quantity changes in accordance with the absolute value of the reference lateral acceleration related quantity.

8. A motion control apparatus for a vehicle according to claim 6 or 7, wherein the target lateral acceleration related quantity calculating means is constructed to calculate the target lateral acceleration related quantity in such a manner that the absolute value of the target lateral acceleration related quantity does not exceed a target lateral acceleration related quantity limiting value, which is set in accordance with an actual specification value of the vehicle which influences the generated roll angle of the vehicle.

9. A motion control apparatus for a vehicle according to claim 6 or 7, further comprising:

road-surface friction coefficient obtaining means for obtaining a road-surface friction coefficient, which is the coefficient of friction between a road surface on which the vehicle travels and tires of the wheels of the vehicle; and

target lateral acceleration related quantity limiting means for setting a target lateral acceleration related quantity limiting value in accordance with the road-surface friction coefficient and for limiting the target lateral acceleration related quantity, when the absolute value of the target lateral acceleration related quantity is greater than the target lateral acceleration related quantity limiting value, in such a manner that the absolute value of the target lateral acceleration related quantity coincides with the target lateral acceleration related quantity limiting value.